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ABSTRACT

The bibliography contains over 50 annotated citations of research on the nature of maternal speech and its effects on child language development. It is limited to studies focusing on verbal features of mothers' speech to normal one-to-four-year-olds learning English. The first section is devoted to literature describing characteristics specific to maternal speech, variations found within maternal speech, and explanations for maternal speech. The second part cites studies of the features of maternal speech that assist in language acquisition, correlational studies, and criticisms of these studies. The studies are briefly reviewed in a summary section, and an unannotated bibliography is appended. (MSE)

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THE RELATIONSHIP BETWEEN MATERNAL SPEECH AND CHILD LANGUAGE DEVELOPMENT: AN ANNOTATED BIBLIOGRAPHY

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INTRODUCTION

An explanation of language acquisition must take into account both the abilities of the language learner and the influence of the speech the child hears. How else would one explain why French children learn French while American children learn English? In the past, the speech of adults to children was believed to be a disorganized and confusing language sample which was unlikely to teach a child grammar. This lead linguists to attach primary importance to the child's innate ability to acquire language.

However, more recently, researchers noted maternal speech to young children differed from speech addressed to other adults. The existence of such differences suggested maternal speech could assist in the language learning process. Researchers then turned their attention to identifying and measuring the effects of maternal speech. Mothers who were the primary caretakers of their young children were chosen for study since it was estimated their influence would be the greatest upon the children.

STATEMENT OF THE PROBLEM

Maternal speech plays an important role in the process of language acquisition in young children.

PURPOSE OF THE STUDY

The purpose of the study is to review the research describing the nature of maternal speech and research describing the effects of maternal speech on young children. By more fully describing the relationship between maternal speech and language acquisition, the nature of language acquisition will be more fully understood.

ORGANIZATION

The first part of this study will review literature which describes characteristics specific to maternal speech, variations found within maternal speech and explanations for maternal speech. The second part of the study will review studies which identify features of maternal speech that assist in language acquisition, correlational studies and criticisms of these studies.

LIMITATIONS

The current review of literature was limited to studies which focused on verbal features of mothers' speech to normal young children, approximately one to four years old, learning English. Neither research on non-verbal aspects nor research dealing with infants or newborns was included. The questions of effects of social class or cultural differences were not addressed. In general, when investigating the effects of maternal speech on young children, effects on acquisition of syntax were of primary interest. The question of effects on children's semantic development were not covered by the present study. The study was also limited by time and the resources available.

GLOSSARY

A-A speech - adult speech addressed to another adult.

A-C speech - adult speech addressed to a child.

Contentless utterance - "those utterances that do not make specific reference to objects or events (song, sound, play, imitation and infant vocalization)" (Kavanaugh and Jirkovsky, 1982, p. 301).

disfluency - false starts to utterances, interrupted, uncompleted utterances, ungrammatical repetitions within utterances (Fraser and Roberts, 1975, p. 12).

expansion - a repetition using the child's words in the child's order but also including new words to make an expanded grammatically complete sentence (Nelson, 1973, p. 497).

expanded repetition - example from Drach, 1969, p. 8.

"You wanna sing me a song?"

"Do you wanna sing me a song?"

function - the purpose the speaker intends the utterance to serve in the conversation (Shatz, 1979, p. 1094).

illocutionary level - the goal or function that the utterance is to fulfill (Moerk, 1983, p.5).

lexical - "of or relating to words or the vocabulary of a language as distinguished from the grammar and construction" (Webster, 1986, p. 687).

maternal speech, mothers' speech - refer to speech addressed to young children.

MLU - mean length of utterance, "is an excellent single index of grammatical development because almost every new kind of knowledge increases length" (Brown, 1973, p. 53).

morpheme - "a meaningful linguistic unit whether a free form (as pin) or a bound form (as the -s of pins) that contains no smaller meaningful parts" (Webster, 1986, p. 772).

motherese - term used to describe a systematic, stylistic variant of everyday speech, addressed to children (Newport, Gleitman and Gleitman, 1977, p. 112).

NOTE: for the sake of conformity the present author will neither capitalize nor put in quotes the term motherese.

occasional question - "either replaces a noun phrase in the previous child utterance with a wh- form or reformulates a prior maternal utterance with a wh- form (e.g., What do you want? You want what?)" (Hoff-Ginsberg and Shatz, 1982, p. 11.)

pragmatics - "a branch of the study of signs, dealing with their uses and effects" (Good, 1973, p. 432).

recast - a discourse adjustment in maternal speech that provides new but related syntactic information in response to the child's utterance (Nelson, Carskaddon and Bonvillian, 1973, p. 498).

test question - "eliciting specific information the mother has and expects the child to have" (Shatz, 1979, p. 1095).

type-token ratio - "the ratio of the number of different words (types) in a sample to the total number of words in the sample (tokens)" (Ringler, 1978, p. 155).

semantic - "of or relating to meaning in language" (Webster, 1986, p. 1068).

syntax - "the way in which words are put together to form phrases, clauses, or sentences" (Webster, 1986, p. 1198).

ANNOTATIONS

THE NATURE OF MATERNAL SPEECH

Characteristics of Maternal Speech

Brown, R. and Bellugi, U. (1964). Three processes in the child's acquisition of syntax. Harvard Educational Review, 34, 133-151.

Brown and Bellugi based their report on the findings generated by studying two children, Adam and Eve. Although Brown and Bellugi focused on the child's role in acquiring syntax, they also commented on characteristics of the two mothers' speech. They noted that the mothers' speech was short, simple, grammatically perfect and discussed the here and now. Another feature noticed was the repetitiveness of maternal speech. Thirty percent of the mothers' utterances were expansions. Brown and Bellugi hypothesized that expansions would be an "effective tutorial technique" (p. 143).

Drach, K. (1969). The language of the parent: a pilot study. Working Paper, 14. Language Behavior Research Laboratory, University of California, Berkeley. Educational Resources Information Center, ED 138 109.

Two taped samples of a black mother speaking to her 26 month old son and the mother speaking to two other women were analyzed in order to compare Adult-Child (A-C) speech and Adult-Adult (A-A) speech. Utterance length for A-A speech was found to be longer and more variable than A-C speech. In addition, A-A speech was spoken at a faster rate than A-C speech. Type token ratios showed A-A speech exhibited greater lexical variety that A-C speech. A-A speech was on the average twice as complex syntactically and more variable in its complexity than A-C speech. It was also found that the frequency of questions and expanded repetitions were higher in A-C speech while subordinate clauses were much more frequent in A-A speech. Drach concluded there is a "marked contrast" between A-A and A-C speech (p. 9).

Kobashigawa, B. (1969). Repetitions in a mother's speech to her child. Working Paper, 14. Language Behavior Research Laboratory, University of California, Berkeley. Educational Resources Information Center, ED 138 109.

Using the same speech sample as Drach (1969), Kobashigawa analyzed the sample in terms of the amount and nature of repetition. Approximately 30% of all utterances were found to be repetitions, however, few were exact repetitions. Kobashigawa listed the ways in which repetitions differed from originals. The author also noted that originals and repetitions tended to be the same sentence type. He concluded repetitions did not seem to be prompted by a need to communicate.

Messer, D. (1980). The episodic structure of maternal speech to young children. Journal of Child Language, 7, 29-40.

In this study Messer investigated the way in which repetitions are used in maternal speech. Forty-two mother-child pairs participated. The children fell into three age groups, aged 11, 14 and 24 months. The mothers and children were videotaped during two five minute play sessions.

Messer found that maternal speech was highly redundant both in the use of episodes ("a string of successive utterances which all refer to the same object irrespective of the form of reference used." p. 30) and repetitions. Maternal speech was structured so that successive utterances would refer to the same object. The beginning of each episode was clear by the introduction of a new toy. Initial utterances in the new episode were likely to contain the name of the new referent. Messer also noted that a high number of utterances were repetitions, more than would occur by chance. The author concluded that verbal episodes "may help children to select utterances which are easier to process" (p. 39).

Broen, P. (1972). The verbal environment of the language-learning child. Monograph of American Speech and Hearing Association, no. 17, December.

The language patterns of ten mothers, each with a child between 18 and 26 months old and with a child over 45 months old, were analyzed. The mothers' speech during a five minute play and a five minute story telling situation was compared to speech to the experimenter. Broen found speech to the younger children was slower than speech to the adult and contained pauses at sentence boundaries. Speech to younger children also had fewer disfluencies and less diverse vocabulary. Single word remarks were common as well as repetitions. Broen identified two common sentence types: an imperative form and a naming frame.

Snow, C.E. (1972). Mothers' speech to children learning language. Child Development, 43, 549-565.

This article described three experiments conducted with 24 mothers with children aged two to ten and six women with no children. In the first experiment mothers were taped talking to a two-year-old, a ten-year-old, an absent two-year-old and an absent ten-year-old. In the second experiment, mothers were recorded performing various tasks, ranging from easy to difficult, with their two-year-olds. And in the third experiment, the non-mothers were asked to make a recording while pretending to speak to a two-year-old.

Based on the three experiments, Snow found that maternal speech to young children is more simple and redundant than speech to older children. Changes in maternal speech also were found to be somewhat dependent on the presence of the child. In addition, the difficulty of the linguistic task did not compel mothers to speak more simply. Finally, mothers were slightly better at anticipating speech changes for children than non-mothers. (p. 561) Snow also discussed the potential value of grammatical simplification and repetition to language learning children.

Phillips, J.R. (1973). Syntax and vocabulary of mothers' speech to young children: age and sex comparisons. Child Development, 44, 182-185.

Thirty mother-son pairs and 27 mother-daughter pairs (the children were eight, 18 and 28 months old) were involved in this study. Mothers' speech to their children in a free play situation was compared to mothers' speech to the experimenter on ten measures of syntax and vocabulary. Comparisons were also made of speech addressed to the different age groups.

No clear sex based differences were found in the speech samples. However, the speech addressed to the children was less complex syntactically and contained a more concrete and less diverse vocabulary than speech to the experimenter. Some differences were found between the speech to 18 month old and 28 month old children, but no differences were noted in the speech addressed to eight month old versus 18 month old children. This finding lead Phillips to hypothesize that adjustments in maternal speech depend "on aspects of communication between child and mother which are not present at eight months" (p. 185).

Remick, H. (1973). Maternal speech to children during language acquisition. Paper based on doctoral dissertation, University of California, Davis. Educational Resources Information Center, ED 072 863.

The speech of eight mothers talking to their 16-30 month old daughters was compared to speech addressed to the investigator. In comparing A-C speech to A-A speech, Remick found that a more restricted vocabulary was used in A-C speech. A-C speech was spoken at a slower rate and used fewer connectives. Additional findings showed that the average fundamental frequency (voice pitch), was higher in A-C speech. Elicitation questions were most frequent in mothers of daughters at the one-word utterance stage and almost all yes-no questions required an affirmative response. Remick noted the present tense was used in the majority of utterances. In A-C speech mothers tended to talk about the child and not themselves. The author cautioned that care should be taken when generalizing from these results because "probably only first born or well spaced children in middle and upper class nuclear families interact so intensively with their mothers" (p. 10).

Sachs, J., Brown, R. and Salerno, R. (1976). Adult speech to children. In W. von Raffler-Engel and Y. Lebrun (Eds.), Baby talk and infant speech (pp. 240-245). Lisse, Netherlands: Swets and Zeitlinger.

Adult speech to adults was compared to adult speech to children in this study. Five adults, none of whom were parents, participated. The adults were videotaped telling a story first to a 22 month old girl and then to another adult. The adults' speech was analyzed for rate of speech, number of sentences, use of past tense and type of sentence. (p. 242)

Significant differences were found in rate of speech, use of questions and complex sentences, and number of sentences spoken. However, differences were not found in the use of past tense or simple declarative sentences. The results indicated that A-C speech was slower, contained more sentences per time unit, contained a greater percentage of questions and a smaller percentage of complex sentences than A-A speech. No differences due to the subject's sex were found in the speech samples. Sachs, Brown and Salerno also commented on features of A-C speech that were noticed, but not measured. An analysis of number and type of concepts suggested that more complex and a greater number of concepts per time unit were used in A-A speech.

Variation Within Maternal Speech

Pfuderer, C. (1969). Some suggestions for a syntactic characterization of baby-talk style. Working Paper, 14. Language Behavior Research Laboratory, University of California, Berkeley. Educational Resources Information Center, ED 138 109.

The data used for this report were the transcripts of adult to child speech from the work done by Brown with the children Adam, Eve and Sarah. Early, middle and late excerpts for each child were taken from Brown's transcripts. The simplicity of the utterances for these different excerpt points were analyzed.

Pfuderer found that simpler sentence types were used in the earlier transcripts, while in later records, there was a rise in complex sentence types. In addition, restrictions were found on the amount of extra semantic information used in speaking to the child. Again it was noted that more semantic information was given as the child developed. The author suggested the increase in complexity of speech directed to children may be correlated to language production or comprehension of the child.

Fraser, C. and Roberts, N. (1975). Mothers' speech to children of four different ages. Journal of Psycholinguistic Research, 4 (1), 9-16.

Participants of this study included 32 mothers and their children aged 18 months, 30 months, four years and six years. The mothers were recorded speaking to their children in two situations: a toy building task and a story telling task. Mothers' speech was analyzed for amount and rate of speech, MLU, disfluencies, syntactic complexity and diversity of vocabulary.

Neither sex nor birth order of the child were found to be related to mothers' speech. However, both task setting and child's age affected maternal speech. During the story telling task, mothers said more and used longer and more complex utterances with a richer vocabulary. The most significant effects of child's age occurred between 18 and 30 months. In general length, complexity of utterances and richness of vocabulary increased in relation to the child's age.

Longhurst, T. and Stepanich, L. (1975). Mothers' speech addressed to one-, two- and three-year-old normal children. Child Study Journal, 5 (1), 3-11.

Longhurst and Stepanich taped 36 mothers with their one-, two-, and three-year-old children in a play situation for ten minutes. Mothers' speech was measured on both the semantic and syntactic levels. Unlike Phillips (1973), differences on the semantic level were not found to be significant in the mothers' speech. On the syntactic level, it was found that MLU increased with the child's age. The percent of questions asked for each age group did not change, however, type of question asked did change. Mothers of one-year-olds asked more yes-no questions while mothers of three-year-olds asked more information questions and mothers of two-year-olds asked more clarification questions. The authors discussed possible reasons for the change in question types.

Lord, C. (1975). Is talking to baby more than baby talk? A longitudinal study of the modification of linguistic input to young children. Portions of paper presented at the Biennial Meeting of the Society for Research in Child Development, Denver, CO, April 10-13, 1975. Educational Resources Information Center, ED 116 813.

This study, involving three mothers and their children (six to 18 months old), focused on the changes over time of the mothers' mean length of utterance in morphemes. Lord found the mothers' MLU in morphemes did increase over time, but not in a linear fashion. Mothers' speech decreased in complexity near the time of the child's first word and then increased as the child produced more words. A corresponding change in language teaching strategies accompanied the increase in MLU. For example, mothers used fewer imperatives and more interrogatives as well as fewer imitations and more expansions. Lord believed that along with some other type of information, "mothers modified their speech on the basis of linguistic cues from their children" (p. 7).

Seitz, S. and Stewart, C. (1975). Imitations and expansions: Some developmental aspects of mother-child communications. Developmental Psychology, 11 (6), 763-768.

Eighteen mother-child pairs took part in this study examining the way in which mothers alter their language complexity. The children were divided into a 23 month old group and a 56 month old group. The mothers and children were videotaped in a play situation. Child utterances were coded as elicited, imitative or spontaneous, while maternal utterances were coded as to sentence type.

Mothers of older children had a longer MLU than mothers speaking to younger children. Utterance type did not differentially influence the MLU difference between the two groups. For the younger group, a positive correlation was found between mother expansion and child imitation, suggesting when a mother perceived her child trying to talk, she responded in a way to help him/her say what s/he was trying to say. For both groups there was also a positive correlation between mothers' use of wh-questions and children's frequency of responding. Seitz and Stewart felt this indicated mothers' checking the child's understanding by his/her responsiveness to questions.

The authors proposed that "child speech that is responsive to mothers' speech provides a gauge whereby mothers monitor their language to the child. This enables the child to exert an active influence on his language environment so that it changes with his increasing competence" (p. 768).

Cross, T. (1977). Mothers' speech adjustments: the contributions of selected child listener variables. In C.E. Snow and C.A. Ferguson (Eds.), Talking to children: language input and acquisition (pp. 151-188). Cambridge: Cambridge University Press.

The subjects of this study were 16 mother-child dyads. The children aged 19-36 months were selected because they showed signs of rapid language development. Tapes were made of the children and mothers playing together at home. Measures of the children's speech were taken of developmental aspects to which it was believed mothers were sensitive. Mothers speech was coded in the areas of discourse features (the semantic relatedness of mother's to child's utterances), referential characteristics (whether the utterance referred to immediately present or to displaced objects and events), conversational style and syntactic features.

Little evidence of mothers' speech adjustments was found at the syntactic level, but strong evidence was found at the discourse and semantic levels. There was a stronger association of features of mothers' speech with the child's receptive ability than with age, productive ability or vocabulary. Cross suggested that the form of "fine-tuning" was likely to vary from one period of development to the next. The author concluded, "In general the input to rapidly developing children is graded quite continuously in tune with their linguistic and communicative abilities" (p. 163).

Kavanaugh, R. and Jirkovsky, A. (1982). Parental speech to young children: a longitudinal analysis. Merrill-Palmer Quarterly, 28 (2), 297-311.

The goals of this study were to describe characteristics of mothers' and fathers' speech to young children and to observe the relationship between parental speech and advances in the child's verbal abilities. Four families participated in the study. The children were nine months old at the beginning of the study and 16 months old at the end of the study. The families were taped in their homes playing with their children with only one parent present at a time. Parental speech was measured for complexity, sentence type and semantic content. Growth in child language was observed in records kept by the mother and the child's receptive language was tested.

Measures of parental speech indicated that both mothers and fathers adopted a simplified speech register. Parental MLU was found to vary over time. Exact self-repetitions declined over time, suggesting parents did not feel a need to repeat as the child spoke more. In the semantic category, contentless utterances declined over time while reference to absent objects increased. Kavanaugh and Jirkovsky concluded that "children influence the form and function of the input they hear," (p. 308) and that parents "adjusted their speech in response to changes in the child's language" (p. 309).

Bellinger, D. (1980). Consistency in the pattern of change in mothers' speech: some discriminant analyses. Journal of Child Language, 7, 469-487.

The speech of 40 mothers addressing children in four different age groups, (12, 20, 27 months old and five years old) was compared to see if the child's age could be predicted from characteristics of the mothers' speech. The mothers and children were taped in a play setting. The mother was asked to involve the child in several tasks in which the child would need help completing. Twelve aspects of mothers' speech were considered in analysis on the levels of syntax, semantics, pragmatics and discourse.

Analysis showed that the age of the child could be predicted from the mother's speech. The greatest difference between age groups was between 20 and 27 months and the least difference noted was between 27 months and five years. Bellinger commented that "the fact that mothers' group membership could be predicted very accurately from brief samples of speech confirm the expectation that there is striking consistency across mothers (at least white, well-educated, upper-middle-class mothers) in the way they talk to children of the same age within the one-five year range" (p. 482).

Kaiser, A.P., Blair, G. and Nielson, L. (1985). Mothers' strategies for eliciting child verbalizations. Paper presented at the Annual Meeting of the Boston Child Language Conference, Boston, MA. October 26, 1985. Educational Resources Information Center, ED 268 782.

This study focused on the changes in mothers' use of eliciting strategies over an eighteen month period. Seven mother-child dyads were videotaped in their homes beginning when the children were 16 months old and ending at 30 months. Mother utterances were analyzed on the following criteria: type of question asked, amount of cue given and complexity of child response expected. Child responses were analyzed on their degree of correctness.

Changes in mother expectations in child response were indicated by mothers asking more complex questions as the children's language skill increased. The number of episodes ("sequences of mother elicitation when child failed to respond" p. 8) increased. Repetition also increased indicating the mothers believed their child understood their original question and were not willing to recast their question.

Rogers-Warren, A.K., Nielson, L. and Blair G. (1985). Longitudinal changes in mothers' questions to their language learning children. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Toronto, Canada, April 25-28, 1985. Educational Resources Information Center, ED 256 506.

The changes made in mothers' strategies for eliciting verbal responses (EVRs) from their children over an eighteen month period were examined in this study. Seven mother-child couples were videotaped in their homes. The transcripts of these tapes were analyzed in terms of the cue, form and complexity of the mother's EVR, the child's responsiveness to the EVR and the mother's feedback to the child response. It was found that the mothers expected more complex answers from their children over time while child responsiveness increased. Rogers-Warren, Nielson and Blair indicated that there is indeed a relationship between mothers' questioning techniques and their children's increased language skills, as measured by mean length of utterance (MLU), but they felt it was uncertain whether or not EVRs preceded or followed child verbal ability.

Lieven, E.V.M. (1978). Conversations between mothers and young children: individual differences and their possible implications for the study of language learning. In N. Waterson and C.E. Snow (Eds.), The Development of Communication (pp. 173-187). Chichester: Wiley and Sons.

In this analysis of conversation between two mothers and their daughters, one 18 months old and the other 20 months old, Lieven noticed differences in the way in which the mothers responded to their children. Analysis of the mothers' speech showed many of the features expected in maternal speech. However, one mother responded more often and used more extensions and expansions than the other mother. Lieven also noticed differences in the way the children used language. The investigator found that s/he responded to the children differently, suggesting that the child's conversational skills may influence the type or quality of input received.

McDonald, L. and Pien, D. (1982). Mother conversational behavior as a function of interactional intent. Journal of Child Language, 9, 337-358.

McDonald and Pien examined the question of whether or not mothers' conversational behavior could be categorized by mothers' intention to converse with or control child behavior. Eleven mothers and their children aged 29-36 months were taped in a play situation. Maternal utterances were categorized on the basis of their illocutionary force. In addition, talkativeness, rate of topic change and mother dominance of conversation were noted.

Variation among individual mother's speech style was pronounced. The variation was not just a response to a different age or linguistic level of the child. Two opposing groups emerged from the data: a conversation eliciting cluster and a directive cluster. The two clusters of behavior were strongly and negatively related. Thus, a mother who is highly directive of her child's behavior is less likely to engage in conversation eliciting techniques. McDonald and Pien found that characteristics necessary to meet the needs of both types of behavior were similar, such as the tendency to speak in short, simple and slowly presented sentences. (p. 355)

Olsen-Fulero, L. (1982). Style and stability in mother conversational behavior: a study of individual differences. Journal of Child Language , 9, 543-564.

The purpose of this study was to explore differences in conversational style among 11 mothers and to see if maternal conversation styles were consistent over time (two sessions). The subject and categorization of mothers' speech were the same as in the McDonald and Pien (1982) study. The data showed the conversation measures that demonstrated the greatest variability and stability were those which indicated the intention of the mother as either directive or conversation eliciting. Olsen-Fulero detailed various "portraits" of mothers based on their interactional intent when speaking to their child. The author felt that future research should "consider stylistic aspects of mother conversational behavior to clarify the relationship between that behavior and the differential development of linguistic, conceptual and social development in the child" (p. 562).

Explanations for Maternal Speech

Gelman, R., and Shatz, M. (1977). Appropriate speech adjustments: the operation of conversational constraints on talk to two-year-olds. In M. Lewis and L. Rosenblum (Eds.), Interaction, conversation and development of language (pp. 27-61). New York: Wiley.

Because long and complex utterances can be found in motherese, Gelman and Shatz believed syntactic explanation for motherese inadequate. They chose to investigate the extent to which conversational constraints influence speakers of motherese. The authors compared the speech of four-year-olds talking to two-year-olds and mothers' speech to two-year-olds for appropriateness. Appropriate was defined as containing "content a two-year-old might understand and/or respond to" and having style that "conformed to conventional standards" (p. 57).

Gelman and Shatz felt that both four-year-olds' and mothers' speech were appropriate for two-year-olds, but they found mothers' speech style to be more subtle and less blunt than four-year-olds' speech. The authors concluded that "motherese comes about as a function of the speaker's intent to convey certain messages in certain ways and according to conversational constraints" (p. 59).

Gleason, J.B. (1977). Talking to children: some notes on feedback. In C.E. Snow and C.A. Ferguson (Eds.), Talking to children: language input and acquisition (pp. 199-205). Cambridge: Cambridge University Press.

Based on informal observations of feedback from 18 month old children, grade school children, and adults. Gleason offered an explanation for some of the characteristics of maternal speech. Gleason noted that mothers of 18 month olds tended to repeat themselves most when their child failed to respond. The author observed that maternal expansion of young children's speech could be seen as the adult trying to maintain the conversation for the child. Gleason concluded one possibility for explaining maternal speech "is that children themselves help shape the language behavior of those who speak to them by the kind of feedback they produce" (p. 204).

Newport, E.L. (1977). Motherese: the speech of mothers to young children. In N.J. Castellan, Jr., D.B. Pisoni and G.R. Potts (Eds.), Cognitive theory: volume 2 (pp. 177-217). Hillsdale, NJ: Lawrence Erlbaum Associates.

Newport investigated the nature of mothers' speech to young children, adjustments in mothers' speech and the effects of mothers speech on young children. Fifteen mother-daughter pairs participated in the study. The children were divided into three age groups: 12-15 months, 18-21 months and 24-27 months. Each child's syntactic sophistication was estimated by ten measures of syntax and then vocabulary size was estimated by number of word types produced during the session. Samples of mothers' speech to the experimenter and in free conversation with the child was coded on syntactic and discourse features (repetition and imitation).

Based upon the results indicating simplification in motherese and evidence of adjustments in maternal speech, Newport explained them as being a function of conversation and a way of communicating with a deficient listener. Newport did not feel that the properties of motherese support the claim that it is a teaching language. She concluded the helpfulness of motherese exists only within the constraints of prior linguistic and cognitive structure in the child. (p. 214)

Snow, C.E. (1977). The development of conversation between mothers and babies. Journal of Child Language, 4, 1-22.

The reason for this study was to evaluate the claim that characteristics of maternal speech are due to limitations in the child's comprehension and attention. Two mother-child pairs took part in the study when the children were from 3 to 18 months old. Snow felt that by analyzing the prelinguistic stage in infants, before they showed signs of attention and comprehension, the hypothesis that mothers responded to these cues would be tested. A number of syntactic measures were used to analyze changes in mothers' speech.

Snow found mothers' MLU showed little change over the 15 month time period. However, she did find changes that occurred in the mothers' speech at around seven months, before the children could talk. This lead her to reject the hypothesis that mothers respond to linguistic cues of the child. Instead, Snow argued that "the changes in maternal speech result from the baby's ability to take turns in the conversation" (p. 11).

Cross, T. and Morris, J. (1980). Linguistic feedback and maternal speech: comparisons of mothers addressing infants, one-year-olds and two-year-olds. First Language, V, 98-121.

Mothers talking to pre-linguistic infants from three to six months and 10-12 months old were compared to mothers speaking to 22-28 month old children. Cross and Morris hoped to determine the roles played by a child's linguistic ability, age and ability to take part in a conversation in influencing changes in maternal speech. The authors found that "overall comparisons between the groups yielded differences which supported the hypothesis that major modifications were made in mothers' speech at the stage when the child comprehends and uses some language" (p. 106). Cross and Morris also stated the results supported the hypothesis that aspects of mothers' speech are in response to "attentional information processing and linguistic limitations" (p. 119) of the child. They added that the results provide stronger support for the idea that child feedback is a determinant in explaining maternal speech than Snow's (1977) explanation that the child serves as a conversational partner.

Levinson, J. (1980). The relationship between child utterances and parent responses. Papers and Reports on Child Language Development, 19, 129-136, Stanford University, California.

The purpose of this study was to describe semantic-syntactic and discourse characteristics of parental speech and how they relate to variation in the child's language. Three mothers and their children 22 to 26 months old participated. Adjacent parent-child utterances were analyzed. Parental responses were categorized as to response style (for example: question, expansion, correction), and semantic syntactic relations. Child utterances were categorized as to their completeness and accuracy.

Levinson found that mothers frequently expressed the same semantic-syntactic relation as in the child's preceding utterance (p. 130). This suggests the parents followed the child on the context level. Another finding was that mothers' responses co-varied with the accuracy and completeness of the child's utterance (p. 132). Levinson concluded that "in the process of evaluating the various factors in parent language and their relationship to child language growth, the influences of the child's language on that of the parent, and the interactions at the level of the individual utterances must also be considered as important factors" (p. 135).

EFFECTS OF MATERNAL SPEECH

Identifying Features of Maternal Speech Which Aid in Language Acquisition

Brown, R., Cazden, C. and Bellugi-Klima, U. (1969). The child's grammar from I to III. In J.P. Hill (Ed.), Minnesota symposia on child psychology, volume 2 (pp. 28-73). Minneapolis: University of Minnesota Press.

In addition to discussing aspects of language acquisition for the children Adam, Eve and Sarah, Brown, Cazden and Bellugi-Klima also discussed the effects of variation in frequency with which certain grammatical constructions were modelled by their parents and variation in frequency of certain parental responses. Brown et al. stated there is some evidence that modelling frequency affected acquisition. They found no evidence of effect for parental expansions and approval-disapproval responses. The authors did find that occasional questions were more likely to elicit an appropriate answer than the normal question form. And the children in the sample who progressed most rapidly had mothers who used occasional questions much more often. Brown et al. felt occasional questions could be beneficial to the child because they allowed the child to contrast interrogative and declarative forms. However, they concluded the role of occasional question is still unknown.

Brown, R. and Hanlon, C. (1970). Derivational complexity and order of acquisition in child speech. In J.R. Hayes (Ed.), Cognition and the development of language (pp. 11-54), New York: Wiley.

In one section of this chapter, Brown and Hanlon examined adult responses to children's correct and incorrect utterances. Data for this analysis were taken from the transcripts of the children Adam, Eve, Sarah and of their parents' speech to them. Children's utterances were scored as either grammatically correct or incorrect. Parent responses were coded as approving or disapproving. Brown and Hanlon found that neither approval nor disapproval were contingent on syntactic correctness of child utterances. They did find, however, that elicit approval and disapproval were linked with the truth value or phonlogical aspects of the utterance.

Hirsh-Pasek, K., Treiman, R. and Schneiderman, M. (1984). Brown and Hanlon revisited: mothers' sensitivity to ungrammatical forms. Journal of Child Language, 11, 81-88.

Forty mother-child pairs were involved in this study which sought to replicate and challenge the findings of Brown and Hanlon (1970). The children, two to five years old, were evenly divided into four groups by age. Mother-child speech was taped during a one-half hour play session. Each child's utterances were coded for their well- or ill-formedness. Maternal utterances were coded as explicit approval or either strict-, loose- and non-repetitions.

Consistent with Brown and Hanlon's findings, explicit approval or disapproval was not related to well-formedness. Rather, the truth value of the statement dictated approval or disapproval. In contrast to Brown and Hanlon's conclusion that children receive no feedback from adults, it was found that mothers (for the two-year-olds only) were inclined to repeat more ill-formed than well-formed utterances. Hirsh-Pasek, Treiman and Schneiderman concluded the verbal environment does provide subtle cues for the child, but it is not yet known to what extent the child uses these cues. (p. 87)

Demetras, M.J., Post, K.N. and Snow, C.E. (1986). Feedback to first language learners: the role of repetitions and clarifications questions. Journal of Child Language, 13, 275-292.

Four mother-child pairs were involved in this study. The children were approximately two years old when the study began and were taped in their home over a six to eight month period. The children's speech was coded in terms of the well-or-ill-formedness of their utterances, while mothers' responses were coded as either explicit or implicit feedback.

It was found that children do receive implicit positive and negative feedback differentiated to the well-or-ill-formedness of their utterances. Explicit feedback was non-differentiated. Demetras, Post and Snow believed that children can use the implicit feedback they receive as a basis for correcting or confirming their internal grammatical rules. Demetras et al. stated that if we assume children speak in order to communicate, and failure to do so represents implicit negative feedback, then a large number of maternal responses can represent negative feedback (p. 286). Thus, maternal speech provides information for a child to identify his/her own ill-formed utterances.

Brown, R. (1973). A first language: the early stages. Cambridge, MA: Harvard University Press.

This book reported on the extensive findings on language acquisition for the children Adam, Eve and Sarah. In one section, Brown examined the frequency of 14 morphemes in the parent's speech and whether the frequency of these morphemes affected the order in which the children acquired them. Brown found a high correlation for the order of frequency of the morphemes among the parents and a high correlation for acquisition order among the children. However, after statistical analysis, he concluded "there is no clear evidence at all that parental frequencies influence the order of development of the forms we have studied. I am prepared to conclude that frequency is not a significant variable" (p. 368).

Moerk, E.L. (1980). Relationships between parental input frequencies and children's language acquisition: a reanalysis of Brown's data. Journal of Child Language, 7, 105-118.

Moerk reanalyzed Brown's (1973) data of the children Adam, Eve, Sarah and their parents in order to evaluate Brown's claim that the frequency of input is not a significant variable in language acquisition. Moerk found the morpheme most frequently used by the parents was also the one the children mastered first. He also noted the input frequency for Sarah was lowest and she developed more slowly linguistically than the other two children. In analyzing Eve's use of the preposition in, it was again found that frequency of parental use was related to frequency of child's production. The evidence of short-term effects of input frequency were illustrated by analyses of specific parent-child interactions. Despite the fact that Moerk could not establish statistical significance and the number of child-parent triads was small, Moerk concluded there is "strong evidence for effects of input frequencies in Brown's data" (p. 116).

Nelson, K.E., Carskaddon, G. and Bonvillian, J. (1973). Syntax acquisition: impact of experimental variation in adult verbal interaction with the child. Child Development, 44, 497-504.

This experiment was designed to test the effects of recasting sentences on language acquisition. Twenty-seven children, aged 32 to 40 months, were divided into three groups: 1) a control group who received no experimental intervention; 2) a "recast" group that heard recast sentences; and 3) a "new sentence" group that heard short and grammatically complete sentences which excluded content words of the child's utterance. Pre- and post-testing were used to determine child language development. Results showed the three groups match only on MLU. Children in the recast group were measured to be more linguistically advanced than the control group on five measures of syntactic development.

Nelson, K.E. (1977). Facilitating children's syntax acquisition. Developmental Psychology, 13 (2), 101-107.

Investigation of the influence of recasts on acquisition of complex verbs and complex questions was the focus of this experiment. Twelve children aged 28-29 months were divided into two groups. One group received complex question recasts while the other group received complex verb recasts. Before the experiment all of the children lacked these forms in their speech. Intervention took place over a two month period in five one-hour sessions. The results showed clearly that the type of intervention affected the children's syntactic acquisition. The children who heard complex verb recasts began to produce complex verbs and the children who heard complex question recasts began to produce complex questions. Nelson believed recasting "may be a central part of the facilitation of syntax" (p. 106). The author felt recasting was helpful because it allowed the child to compare his/her own sentences with those of an adult.

Baker, N. and Nelson, K.E. (1984). Recasting and related conversational techniques for triggering syntactic advances by young children. First Language, 5, 3-22.

Baker and Nelson reported on two experiments in this article, both of which utilized the technique of recasting children's utterances. In the first experiment, two boys, aged 41 months and 46 months, alternately had passives and gerunds recast or modelled, and compound verbs, auxiliaries and reflexives recast or modelled. In the second experiment, six children 30-38 months old were divided into two groups. One group had their utterances recast by an experimenter and the other group heard the experimenter recast his own utterances. Auxiliaries, relative clauses and passives were manipulated in this experiment.

Results showed that all but one of the children began to use at least two of the targeted forms, with some children producing more. The children used the passive with complexity and variation in meaning comparable to that of older children. Baker and Nelson believe recasting is an "effective way of triggering the acquisition of new parts of a syntactic system" (p. 14).

Newport, E.L. and Gleitman, H. (1977). Maternal self-repetition and the child's acquisition of language. Papers and Reports on Child Language Development, 13, 46-55, Stanford University, California.

The focus of the two studies reported upon here, one naturalistic and the other experimentally controlled, was maternal self-repetition and its relation to language acquisition. In the first study, three mother-child pairs, children aged 15-20 months, participated. Repetition sequences in mothers' speech were identified and child response was measured according to the conditional probability of response ("the probability of a response on any trial, given that there was not response on preceding trials" p. 47). The probability of child response stayed the same, rather than increasing, thus demonstrating no evidence of learning.

The six subjects of the second experiment were 19-32 months old. Their mothers spoke from a prepared script containing repetition sequences and pseudorepetition sequences. Comparison of the probability of response to repetitions versus pseudorepetitions permitted determining whether there was an effect of repetition per se. No difference was found between responding to repetitions versus pseudorepetitions and response rate declined over trials.

On the basis of these two studies, Newport and Gleitman concluded "the child shows no evidence of processing repetition sequences as repetitions. These results make it highly implausible, at least for children between the ages of one to two-and-one-half, that repetition per se has any beneficial effects on language acquisition" (p. 53). The authors did agree, however, that repetition allowed more opportunities to respond.

Cross, T. (1978). Mothers' speech and its association with rate of linguistic development in young children. In N. Waterson and C.E. Snow (Eds.), The development of communication (pp. 199-216). Chichester: Wiley and Sons.

In this study, 16 children (16-33 months old), were divided into two groups according to their rate of language growth, an accelerated group and a normal growth group. Their mothers' speech, recorded in home play sessions, was analyzed on 60 syntactic, semantic, discourse and fluency features.

The findings of this study suggested rapid linguistic growth is associated with input related to the child's communicative intention (p. 214). Mothers of the accelerated children used more expansions, semantic extensions and repetitions than children in the normal language growth group. Mothers' speech to the accelerated group had fewer utterances that were new to the discourse. In addition, their speech contained fewer disfluencies, run-on sentences and fewer utterances per conversation turn. Cross hypothesized that "it is the extent to which the mothers' discourse adjustments permit the child to accurately guess her meaning that is important to acquisition" (p. 214). Cross also pointed out it is not clear whether the child influences the adult speech or vice versa.

Ellis, R. and Wells, G. (1980). Enabling factors in adult-child discourse. First Language, 1, 46-62.

The purpose of this study was to investigate the nature of adult fine-tuning and how this affects the child's linguistic development. Sixty-four children between the ages of 15 and 42 months were recorded in their homes. The children were divided into three groups according to their rate of language development: Early Fast Developers (EFD), Late Fast Developers (LFD), and Slow Developers (SD). Adult speech to the children was coded in terms of 34 speech variables including complexity, content, discourse features and referential features. Ellis and Wells stated the evidence for fine-tuning on the part of adults was mixed. Adjustments were noted for syntactic complexity and utterance length but adjustments in context and reference were less noticeable and few adjustments were noted for discourse features.

Ellis and Wells then discussed features of adult speech associated with accelerated language development. They identified a higher frequency of discourse and reference features such as acknowledgments, corrections, prohibitions, instructions, imitations, repetitions, questions, indirect and direct commands in the adult speech to EFD. In addition, more adult utterances to EFD referred to the immediate activity involving the child.

Shatz, M. (1979). How to do things by asking: form-function pairings in mothers' questions and their relation to children's responses. Child Development, 50, 1093-1099.

Questions addressed to 17 children, 18-34 months old, were examined to see whether or not there existed a correlation between the form used to express them and the purpose or function they served in conversation. The children were grouped into a low or high group, dependent upon their stage of language development. Children's responses to mothers questions were also analyzed.

The data did not support the view that mothers provide a narrow set of form-function pairings and gradually broaden them as the child becomes more competent. The form-function pairings were not especially simple for the low group. The same amount of functions and form per function were addressed to the low group as to the high group. Low group mothers used more characteristic pairs than did high group mothers but the use of such pairs was less than half of all questions for the low group. The use of these characteristic pairs were limited to test questions.

Children's rate of appropriate response did not seem to be dependent on the mothers' use of characteristic pairs. In only one category, test questions, did the use of characteristic pairs correlate with children's ability to respond.

Lord, C. and Leimbach, M. P. (1983). A longitudinal study of form-function relations in a mother's questions and her child's responses. Developmental Psychology, 19 (4), 585-590.

The relationship between the semantic and syntactic aspects of form and the conversational function of a mother's questions to her daughter, Sadie were assessed. Sadie's response and use of form-function relation in the child's questions to her mother were also analyzed. Sadie was from six to 30 months old during the course of the study. Transcripts were divided into three periods according to Sadie's language development. Mother's questions were analyzed on the syntactic, semantic and functional levels. Form-function pairings that occurred at greater then chance frequencies were identified.

Lord and Leimbach found semantic and semantic-syntactic form-function pairings were most common in mother's questions in Sadie's earliest stages of development. Sadie's correct verbal responses correlated with semantic form-function pairings during her one word stage and shortly thereafter, but not in later stages. This may be explained by the fact that many form-function pairings in the early stage were requests for labels. Form-function relations were identified in Sadie's speech in her late stage of development.

"Effects and Non-Effects" of Maternal Speech

Nelson, K. (1973). Structure and strategy in learning to talk. Monographs of the Society for Research in Child Development, 38 (1-2, Serial No. 149).

This monograph which deals with the child's strategies in learning to talk contains two sections in which parental role is evaluated. Eighteen mother-child pairs participated in the study. When the study began, the children were 10-15 months old. The study lasted one year with a follow-up visit at 30 months. Mother-child interactions were evaluated when the child was from 12-15 months old, and again at two years. Mother utterances were analyzed in the area of content, form and feedback. Standardized tests were used to measure child language growth.

Results from the analysis at 12-15 months showed that neither content nor form had much effect on the child's rate of language acquisition. However, in the area of feedback, the proportion of directions in mothers' speech showed a negative relation to acquisition. A high rate of mother questions was positively related to child comprehension at 20 months, but not earlier, suggesting a variable may have different effects depending on the age. Commands were found to be negatively related to child comprehension. Results at two years indicated that a non-directive, responsive parental style had a positive impact on language acquisition while a directive parental style had a negative effect.

Ringler, N. (1978). A longitudinal study of mothers' language. In N. Waterson and C.E. Snow (Eds.), The development of communication (pp. 151-158). Chichester: Wiley and Sons.

Ten black mothers and their children, all born during the summer of 1970, participated in this study. Ten hours of data for each mother-child pair was collected between 1970 and 1974. In addition to describing characteristics of maternal speech and how it changed after the children learned to talk, effects of mothers' speech on children's language maturity at age five were assessed. Mothers' speech to children at age two was compared to children's speech and language comprehension at age five as measured on standardized tests.

Results indicated that the number of words per proposition used by the mother when the child was two was related to greater comprehension at age five. Mothers who used more adjectives had children with greater expressive ability and comprehension. The number of content words, (nouns, verbs, adjectives), at two correlated negatively with expressive ability at five. And the use of imperatives at two showed a negative correlation with child MLU. Ringler concluded "the way a mother addresses her two-year-old may have lasting effects on the speech and language development of the child" (p. 157).

Newport, E.L., Gleitman, H. and Gleitman, L.R. (1977). Mother, I'd rather do it myself: some effects and non-effects of maternal speech style. In C.E. Snow and C.A. Ferguson (Eds.), Talking to Children: language input and acquisition (pp. 109-149). Cambridge: Cambridge University Press.

Using two samples of spontaneous speech collected from 15 mother-daughter pairs, Newport, Gleitman and Gleitman investigated the relationship between individual differences in mothers' speech styles and children's rate of development. The children were divided into groups by age at the time of the first recording: 12-15 months; 18-21 months; and 24-27 months. A second recording was done six months later. Developmental gains in the children were related to the use of certain syntactic variables by the mothers at the time of the first recording.

Newport et al. partialled out the effect of the different ages of the children, their absolute levels of achievement and the differences between mothers that were due to differences in the level of achievement of the children. They concluded that "certain language-specific aspects of the child's speech seem to be influenced rather dramatically in their rate of growth by aspects of the mothers' usage... In contrast, the measures of child language growth that we take to be indices of universal aspects of language structure and content are, so far as we can see in this limited study, insensitive to individual differences in maternal speech styles" (p. 133).

Furrow, D. Nelson, K. and Benedict, H. (1979). Mothers' speech to children and syntactic development: some simple relationships. Journal of Child Language, 6, 423-442.

Furrow, Nelson and Benedict investigated the relationships between children's verbal environment and their syntactic development. Speech samples were taken from seven mother-child pairs when the children were 18 months old and all at the one-word stage. A second sample was taken nine months later. Mothers' speech was coded on a number of semantic and syntactic aspects. Children's speech was assessed using syntactic measurements. Correlations between maternal variables and child language growth were measured at Time 1 and Time 2.

Based on the resulting correlations, Furrow et al. concluded that "aspects of motherese which reflect the use of a simpler communicative style were positively related to language growth" (p. 436). They suggested that although motherese may function as an effective means to communicate with young children, it is also an effective teaching language. Furrow et al. compared their findings to those of Newport, Gleitman and Gleitman (1977), noting that differences in results are due to Newport et al.'s failure to control for the child's level of language competence at the time when effects were assessed.

Moerk, E.L. (1983). The mother of Eve as a first language teacher. Norwood, NJ: Ablex.

In this book, Moerk reanalyzes Brown's data of the speech between Eve and her mother when Eve was 18 to 27 months old. Moerk analyzed four aspects of each utterance: the content of the utterance; the illocutionary level; the level of the code - which included phonetics, phonology, morphology and syntax; and the instructional function or instructional potential of each utterance. Moerk approached this analysis from the theoretical standpoint that maternal speech is a teaching language and thus concluded: "The maternal input is rich enough, provided frequently enough, based upon enough semantic and linguistic redundancy, and is provided with a degree of instructional sophistication..., that it suffices to explain even the accelerated language development of Eve - given an intelligent child with a good cognitive basis upon which to conceive meaning for communication" (p. 106).

Barnes, S., Gutfreund, M., Satterly, D. and Wells, G. (1983). Characteristics of adult speech which predict children's language development. Journal of Child Language, 10, 65-84.

The authors analyzed syntactic, semantic, pragmatic and discourse features of adult speech in order to determine which features were most closely associated with child language development. Participating in the study were 32 children and their parents. The recordings of Time 1 for the children were matched for level of linguistic development and not age. Time 2 recordings were made nine months later and a gain score of the children's language growth from Time 1 to Time 2 was calculated.

Results indicated there was no correlation between length and complexity of adult speech and children's progress. However, interogatives, directives, extending the child's utterance and amount of speech were all found to correlate with at least one measure of child language growth. The authors noted that although the children in this study were matched for language ability at Time 1, it is possible that differences between the children in other respects may have brought forth the differential behavior measured in the adults who spoke to them. (p. 81)

Hoff-Ginsberg, E. (1985). Some contributions of mothers' speech to their children's syntactic growth. Journal of Child Language, 12, 367-385.

The intent of this study was to examine the relationship between mothers' speech and the rate of child syntax growth. Twenty-two mothers and their children 24-30 months old at the beginning of the study, were taped in their homes during play time every two months during a six month period. Measures of child language growth were taken at four different times. Data analysis was comprised of a search for predictive relations between measures of maternal speech and measures of their child's language growth.

Three relationships appeared between aspects of mothers' speech and rate of child syntax acquisition. Each relationship was specific to a particular stage of development. The findings suggested that children analyzed properties of speech they heard and induced linguistic structure from the relationships between adjacent utterances in conversation.

Hoff-Ginsberg, E. (1986). Function and structure in maternal speech: their relation to the child's development of syntax. Developmental Psychology, 22 (2), 155-163.

Twenty-two mother-child pairs participated in this study beginning when the children were from 24 to 30 months old. The pairs were taped at two month intervals over a six month period while the children played with their mothers at home. The children's speech was measured for syntactic complexity and mothers' speech was measured in terms of structure and function or conversational intention. Correlations between maternal speech and child progress as measured by residual gain scores were calculated.

Hoff-Ginsberg found some properties of maternal speech that predicted syntax growth at both the functional and structural levels. She also found some relation between the functional aspects and structural measures of mothers' speech which in turn predicted language growth. These findings suggested there is variability in maternal speech that can not be attributed to communicative intention alone. The author also discussed the role maternal speech plays as data for language learning and as a prod to language analysis.

Criticisms

Cross, T. (1979). Mothers' speech adjustments and child language learning: some methodological considerations. Language Sciences, 1 (1), 3-25.

The results of this correlational study involving 20 mothers and their children 18 months to three years old lead Cross to draw conclusions about inconsistencies in previous research. Cross found the mothers adjusted features of their speech, especially discourse features, in response to their child's linguistic abilities in comprehension and expression. Cross concluded the child plays a role in influencing the nature of his/her linguistic input.

The author pointed out that previous researchers of maternal speech and child language development had failed to take into account the relationship between the child's stage of development, the child's communicative behavior and adults' responsiveness in adapting their speech to these factors. Cross suggested most features of maternal speech which have been considered to assist in language development are those features which are correlated with the development of the child.

Hoff-Ginsberg, E. and Shatz, M. (1982). Linguistic input and the child's acquisition of language. Psychological Bulletin, 92 (1), 3-26.

In one section of this comprehensive article which reviewed the literature on the relation of linguistic input to syntactic and semantic development, Hoff-Ginsberg and Shatz compared the findings of Newport, Gleitman and Gleitman (1977) and Furrow, Nelson and Benedict (1978). Hoff-Ginsberg and Shatz discussed the similarities and differences in their findings and offered explanations for the differences.

Hoff-Ginsberg and Shatz pointed out Newport et al.'s subjects spanned a 15 month age range and so only those findings which are consistent across this span of development would appear. Hoff-Ginsberg criticized Furrow et al. for not cross validating their findings. In addition, since the time span of Furrow et al's data was nine months, the possibility of other factors intervening is greater. Hoff-Ginsberg and Shatz recommended that future research carefully examine the age of the subjects studied and the time interval between assessing input and growth. (p. 12)

Bohannon, J.N. and Hirsh-Pasek, K. (1984). Do children say as they're told? A new perspective on motherese. In L. Feagans, C. Garvey and R. Golinkoff (Eds.), The origins and growth of communication (pp. 176-195). Norwood, NJ: Ablex.

At the end of this chapter Bohannon and Hirsh-Pasek discussed the findings of the Newport, Gleitman and Gleitman (1977) study and the Furrow, Nelson and Benedict (1979) study, and they discussed why they believed there were conflicting results. Bohannon and Hirsh-Pasek criticized these correlational studies for being based on a linear covariance model. They explained this assumes that if there is a relationship between maternal and child speech, the simpler the maternal speech, the greater will be child gains. Instead, the authors proposed a non-linear model that assumes there is an optimal level of length and complexity at different times in a child's development. The authors explained in more detail their non-linear model which they feel will account for discrepancies between the Newport et al. and Furrow et al. studies. Bohannon and Hirsh-Pasek concluded "the hypothesis that motherese assists the process of language acquisition differentially over time deserves further inspection." (p. 192)

Schwartz, R.G. and Camarata, S. (1985). Examining relationships between input and language development: some statistical issues. Journal of Child Language, 12, 199-207.

Schwartz and Camarata examined statistical problems encountered in recent studies of the causal relationship between maternal speech and child language growth. They first discussed difficulties in using gain scores. Next, they looked at aspects of correlational analysis which influence the accuracy of findings. Finally, the authors discussed concerns in the design of recent studies. Schwartz and Camarata, recommended a mechanism of acquisition should be proposed before deciding upon which variables to measure. In addition, they recommended that research shift from passive observational studies to deliberate manipulation if the goal is to determine causal relationships between input and language development.

Gleitman, L.R., Newport, E.L. and Gleitman, H. (1984). The current status of the motherese hypothesis. Journal of Child Language, 11, 43-79.

In this article Gleitman, Newport and Gleitman compare two correlational studies of maternal speech style and its effect on language learning, Newport, Gleitman and Gleitman (1977), and Furrow, Nelson and Benedict (1979), henceforth NGG and FNB, respectively. The comparison was prompted by partially conflicting results in the two studies. Gleitman et al. reanalyzed NGG, taking into account criticisms brought out by FNB. In the current analysis, two groups of children were equated for age. One group consisted of six children 18-21 months old and the older group had six children 24-27 months old. Linguistic differences in the children were handled by partial correlation. The new analytic procedures were similar in many ways to those of FNB.

Gleitman et al. reported that despite the change in procedure, the original findings of NGG reemerge. However, these findings are true only for the younger group. Contrary to FNB, the new analysis suggested that increased complexity of maternal speech is positively correlated with child language growth for the younger group. Gleitman et al. concluded the findings support the view that the child is selective about what he uses from the linguistic environment, when he uses it and what he uses it for in language acquisition. (p. 76)

Furrow, D. and Nelson, K. (1986). A further look at the motherese hypothesis: a reply to Gleitman, Newport and Gleitman. Journal of Child Language, 13, 163-176.

In this article, Furrow and Nelson responded to Gleitman, Newport and Gleitman (1984), henceforth GNG. GNG had reanalyzed the 1977 study in light of criticism brought out by Furrow, Nelson and Benedict (1979), henceforth FNB. Furrow and Nelson believed GNG misinterpreted FNB. Furrow and Nelson discussed what they feel is the appropriate interpretation of the motherese hypothesis, problems they found with GNG's method and treatment and interpretation of data, a response to GNG's criticisms of FNB's analysis and finally a discussion of the relation between language input and language learning.

Furrow and Nelson suggested that an effective teaching language would include the following features: it would use language in contexts easily interpreted by the child; it would adjust the length of utterance to the current ability of the child; and it would expand and recast utterances as needed to aid in comprehension. (p. 175-176)

Scarborough, H. and Wyckoff, J. (1986). Mother, I'd still rather do it myself: some further non-effects of 'motherese'. Journal of Child Language, 13, 431-437.

Scarborough and Wyckoff sought to replicate results of previous studies dealing with the relationship between mothers' speech and child language growth. In discussing the procedure and results of their study, the authors compared their work to the studies by Furrow, Nelson and Benedict (1979), and Gleitman, Newport and Gleitman (1984), henceforth FNB and GNG, respectively. The six children of this study were matched for language development at Time 1. Mothers' speech was coded on seventeen measures which were a combination of the measurement used by FNB and GNG.

Following statistical analysis, Scarborough and Wyckoff stated: "in the present study, none of the motherese effects survived the split-half criterion" (p. 435). They added that the high correlations they did find were inconsistent with earlier findings. The authors theorized the reason consistent effects of motherese have not been found is because "the motherese input threshold (may) be low enough that nearly all children receive the necessary environmental stimulation for language acquisition..." (p. 437). They concluded even experimental observations would not be effective in determining the exact role of motherese in language development.

SUMMARY

A number of features have been identified in which speech to children differed from speech to adults. Brown and Drach both noted utterances in A-C speech were shorter then utterances in A-A speech. A number of researchers (Brown; Drach; Phillips; Snow; Remick; Sachs et al.) found A-C speech was simpler than A-A speech. A-C speech was less complex syntactically, containing fewer connectives and subordinate clauses. Drach, Broen, Remick and Sachs et al. measured the rate of A-C speech to be slower than A-A speech. A-C speech was also found to be highly repetitive (Brown; Drach; Kobashigawa; Broen; and Snow), to contain a higher percentage of questions (Sachs et al.) and to contain many expansions (Brown and Drach). Brown found A-C speech to be grammatically perfect while Broen commented it contained fewer disfluencies than speech to adults.

On the semantic level, Brown, Remick and Phillips found A-C speech discussed the here and now, by using more concrete vocabulary, more present tense verbs and by talking about the child. Drach, Broen, Phillips and Remick measured A-C speech to have a less diverse vocabulary than A-A speech.

In addition to differences between A-C and A-A speech, researchers became aware that A-C speech or maternal speech changed as the child grew more advanced linguistically. Longhurst and Stepanich, Seitz and Stewart, Fraser and Roberts, as well as Lord, all noted an increase in mothers' MLU as the child aged. An MLU increase indicates not only an increase in the length of the utterance but an increase in complexity also.

Cross concluded adjustments in mothers' speech were more pronounced on the levels of discourse and semantics than on the syntactical level. Fraser and Roberts noted richness of vocabulary increased with the age of the child and Pfuderer noted restrictions on extra semantic information diminished over time. Longhurst and Stepanich, Kaiser et al. and Rogers-Warren et al. found the types of questions asked changed with the increasing ability of the child. Lord noticed adjustments in the frequency of imitations, expansions, imperatives and questions. Bellinger found the adjustments in maternal speech to be strikingly consistent across mothers to the extent that the child's age could be predicted from measurements of the mother's speech. Cross concluded mothers tuned into the child's receptive ability. Lord along with Kavanaugh and Jirkovsky felt linguistic cues from the child were the basis for mother's speech adjustments.

Not only was variation found in mothers' speech as their children developed, variation was also found across mothers in their individual speech style. Lieven noted differences in the way two mothers responded to their daughters. Lieven felt it was due to the individual child's conversation skills. McDonald and Pien found variation among mothers could be grouped as either conversation eliciting or directive. Olsen-Fulero found these groupings were consistent over time.

Researchers sought to explain characteristics of maternal speech. Snow and Gleason believed maternal speech was due to the mother's desire to converse with the child. Newport felt maternal speech was not only a function of conversation, but a result of trying to communicate effectively. McDonald and Pien demonstrated characteristics of maternal speech can be due to both the mothers' desire to direct or control the

child as well as to converse. Moerk believed mothers' speech could be explained as a way of teaching children to talk. Cross and Morris concluded the child's feedback played the most important role in shaping mothers' speech and that some features of mothers' speech are due to attentional, processing and linguistic limitations of the child. Levinson believed that interactions at the level of individual utterances could be important factors in determining maternal speech.

Since researchers had carefully described the nature of maternal speech, attention turned to identifying aspects which aided in language acquisition. Brown felt occasional questions could be beneficial to young children because they elicited more appropriate responses from the children in his data. Brown did not feel that parents provided adequate feedback to language learning children, but Hirsh-Pasek and Demetras et al. demonstrated that although parents do not provide explicit feedback according to the ill- or well-formedness of the child's utterance, they do provide implicit feedback. Brown also concluded the frequency of input is not a factor in determining order of acquisition. Moerk refuted Brown's conclusion, claiming there is evidence for effects of frequency in Brown's data.

Experimental studies by Nelson et al., Nelson, and Baker and Nelson demonstrated that recasting a child's utterance is an effective way of advancing syntactic development. Cross found expansions, extensions and repetitions were all associated with rapid linguistic development. Newport and Gleitman, however, did not feel there was any evidence that children learned from repetitions. They concluded repetitions simply allowed more chances to answer. Ellis and Wells identified a number of discourse and reference features which they found associated with rapid

language development. Studies by Shatz as well as Lord and Leimbach did not show form-function pairings to have much effect on the child's ability to respond.

A number of studies attempted to correlate measures of mothers' speech with advances in child language growth. The results were varied and in some cases conflicting. Newport et al. concluded only language specific aspects of children's speech were influenced by mothers' speech. Furrow et al., however, felt that all aspects of language benefited from more simple input. Numerous other aspects of mothers' speech were found to correlate with at least one measure of child language growth. Hoff-Ginsberg found these relationships were specific to a particular stage in the child's development.

Because of the conflicting results obtained by Newport et al. and Furrow et al., a number of criticisms have been leveled against these authors. Other criticisms were not directed against them specifically but were general recommendations for researchers seeking to determine the role of mothers' speech in assisting language acquisition. Cross recommended the influences of the child's stage of development and communicative behavior on the adults' speech be taken into account. Hoff-Ginsberg and Shatz concluded the subjects' age and the time interval between measuring mothers' input and child growth needed to be considered carefully. Schwartz and Camarata pointed out statistical problems and problems of design in recent studies. And Scarborough and Wyckoff theorized the reason consistent effects have not been found is because the threshold for input is low enough that all children receive sufficient input regardless of individual differences in mothers' speech. The debate between Furrow and Nelson and Gleitman et al. on the exact role of motherese continued to be discussed.

CONCLUSIONS

It has been concluded that a modified speech register is used when speaking to young children and that these modification play an important role in assisting children to acquire language. Due to conflicting findings in research, the exact nature of the role of maternal speech has not been agreed upon. Some see the simplification found in maternal speech as necessary in making sentence structure and meaning more apparent to the child. Others feel it is only when the child's processing abilities are tuned into maternal verbal behavior that any assistance occurs.

RECOMMENDATIONS

It is recommended that future research consider the hypothesis that maternal speech assists language development differentially over time. In order to accomplish this, the age of the child, stage of linguistic development and the time interval between measures of maternal speech and assessment of child linguistic growth must be carefully considered. It is also recommended that the most promising maternal variables be identified and tested through direct manipulation, rather than observational studies.

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